CASE

OF

MALIGNANT FIBRO-CELLULAR TUMOUR

INVOLVING THE ILEUM.

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I.—HISTORY OF CASE.

JAMES B., aged 21, consulted me once or twice during the summer of 1861, for indigestion accompanied with tympanitis. He was a thin, pale, cachectic-looking boy, in appearance not more than 15; the second of seven children, all the rest of whom are now living, and the offspring of healthy parents. His heart and lungs were quite sound. He had always been delicate; but the first symptoms of increasing ill-health which attracted his mother's notice, were continually recurring headaches and fits of sickness, especially in the early part of the day; so that for a year before he frequently vomited his meals. The abdomen was tympanitic, with large blue veins coursing over the surface, and some isolated points internally felt hard upon pressure. I did not detect at this period the existence of any circumscribed tumour. The bowels were habitually constipated; and extreme flatulence, especially annoying after meals, was, as the patient complained of no pain in the abdomen, the principal symptom that called for treatment. I naturally supposed that the disease I had to deal with was scrofulous *adenitis mesenterica*. The treatment recommended was, therefore, the free use of cream (for the patient could not take cod liver oil), syrup of the iodide of iron, and an occasional teaspoonful, after meals, of a mixture of equal parts of camphorated tincture of opium and compound tincture of cardamoms.

I presently lost sight of the patient for a few months; but he returned, with all his symptoms greatly aggravated, in March, 1862. About this time, as well as later, my friend Dr. M'Laren had also an opportunity of seeing him. His look was extremely cachectic, the lower extremities œdematous, the abdomen nearly twice its former size and with some amount of ascites. Percussion was tympanitic, when the patient lay on his back, to about an inch below the umbilicus, at which point it became quite dull. An irregularly rounded tumour, as large as the egg of an ostrich, could here be defined both by deep percussion, and better still, by grasping it with the hand, when it appeared quite immovable. On examining the abdomen attentively with the eye, an apparent horn of the tumour, hard to the touch, could be seen actually elevating the parietes at the lower anterior border of the right lumbar region. The patient had no cough, and the heart was quite healthy. I now thought I had to deal with a cancerous affection; and, judging from the immobility of the tumour, felt inclined to regard it as a growth from the periosteum of the spine. I watched the case with interest from day to day; the tumour obviously increasing rapidly in size, and the symptoms, headache, vomiting, anasarca, ascites, &c., getting worse and worse. The bowels were never loose; but their contents were discharged, at frequently recurring intervals, by violent paroxysms of flatus over which the patient had no control. On the 26th of May he quietly died; having been *observed* to be suffering from his malady for at least three years. The abdomen at its most prominent point, a little below the umbilicus, measured at his death three yards in circumference.

II.—PATHOLOGICAL REMARKS.

The body was examined by Dr. Moore and myself on the 28th of May. The difficulties under which this examination was carried out being considerable, the contents of the abdomen alone were inspected; there being no reason to believe that either the head or the chest was affected. In the first place, about three gallons of fluid were drawn off from the peritoneal cavity. Adhesion, after this, was scarcely to be expected; but I could not make out that the visceral layer of peritoneum was diseased at any point where in contact with the parietal layer. On opening the body, the most noticeable appearance was the large quantity of fat deposited in the omentum and appendices epiploicæ. In connection with this I may observe that the patient, though thin and delicate, never presented that appearance of actual marasmus, which a tubercular affection of great severity would probably have caused. The upper part of the small, and

the whole of the large intestine, were enormously distended with gas, as was to be expected from the character of percussion during life. This, as well as the constant paroxysmal escapes of gases by the anus, could readily be accounted for by the pressure of the hypogastric tumour on the sigmoid flexure and rectum. A principal tumour of the size diagnosed during life was actually found to exist, as well as distinct secondary nodules in various parts of the mesentery. In many situations where two portions of the visceral peritoneal layer of the bowel were in contact, they had quite lost their structure by coalescing. The stomach, duodenum, jejunum, cœcum, and colon were, however, free from disease. The spleen and kidneys were healthy; the ileum, on the contrary, was extensively involved in the affection. It was implicated in the principal tumour just as it lay; its convolutions running backwards and forwards through the mass without much apparent displacement. In this course it retained the form of a tube with rigid walls, the diameter of which was not interfered with by the surrounding growth, and which had become incapable of collapsing on pressure from without. A section of the tumour in any direction presented a flat homogeneous surface with one or two roundish or oval openings, corresponding to imbedded convolutions of the intestinal canal which had been divided either in a perfectly transverse, or in a more oblique direction (fig. 1). Several feet of the ileum, commencing a short distance before its junction with the large intestine, must have been imbedded in this manner. The rest of the disease consisted in isolated nodules, varying from the size of a nut to that of a large plum, distributed here and there in the mesentery of the small intestine opposite points where the bowel itself was healthy.

On examining a transverse section of the intestine at any point of its course through the tumour, it was at once evident that the structures originally composing its walls were very unequally affected. The epithelium, in the first place, must have been thoroughly destroyed; the internal surface of the bowel presenting a nearly uniform ulceration. External to the ulcerated surface occurred a hard whitish layer, a quarter of an inch in thickness, representing the mucous layer of the bowel, which naturally measures only about a sixtieth of an inch. Then came the transverse and longitudinal muscular layers, in health of about the same breadth as the tunica mucosa, and here hypertrophied to about the same extent. External to these the subserous layer of peritoneum was converted into a morbid mass of indefinite diameter. Now, wherever in this tumour two convolutions of intestine were in contact, their respective peritoneal coverings have coalesced, disappearing in the mass of disease produced by the junction of the metamorphosed subserous

tissue belonging to the same convolutions. On the other hand, the peritoneum of the bowel on the outside of the tumour, not in contact with any neighbouring convolution, appears to have uniformly escaped. The mucous tunic has ulcerated towards the gut, but the subserous tissue has not ulcerated towards the peritoneal cavity. I made several vertical sections of the outer layers of the tumour; which all showed, under the microscope, healthy connective tissue towards the peritoneal surface, but progressive disease, indicated by the presence of crowded cells, on entering the subperitoneal tissue.

With regard to the seat of the disease, there can scarcely be any doubt that the areolar connective tissue below the peritoneum has here been first affected. The fibrous connective tissue of the peritoneum has only been involved in special circumstances, and the muscular tissue has in great measure escaped without alteration. The areolar tissue under the peritoneum being implicated much more extensively, and also in a far greater degree, than the tunica mucosa, I cannot but regard it as, in this case, the original seat of the new deposit. This view is borne out by the tendency to the formation of isolated nodules in the same subserous tissue where it occurs in the mesentery, apart from the bowel altogether. The mucous tunic of the bowel is affected to a less, though still to a great degree; and the muscular lining lies comparatively unimplicated between the two diseased layers, except for being thickened by infiltration between its fibres.

Such being the apparent seat of the disease, let us examine the elements of which this tumour is composed, to ascertain whether they bear any evidence of being derived from elements normally present in the subserous tissue. In other words, let us ascertain whether the new growth is *homologous* or *heterologous*. Now, it matters not whether we take a portion of the diseased subserous tissue, of the mucous tunic, or of the mesenteric nodules: the elements of the growth are the same everywhere. They consist of cells imbedded in a fibrous matrix of extreme tenuity (fig. 2). These cells show very little tendency to deviate from a common type, and are just the simple, round, embryonic forms which are met with everywhere in connective tissue, when not modified by the pressure of intercellular substance surrounding them. The new growth, in short, is a fibrous tumour; and, the cells immensely preponderating over the interstitial stroma in which they are imbedded, we may call it, according to a simple and convenient distinction, a *fibro-cellular tumour*, or *cellular fibroma*. Such a tumour might naturally be developed from the cells of the areolar connective tissue, or from the parenchyma of the lymphatic glands. In the latter case it would be called by

some pathologists an *adenoma;* but a lymphatic adenoma, or glandular tumour, is in reality not different from a fibro-cellular tumour developed in a tissue where there are no lymphatic glands; for the simple reason that the lymphatic gland is itself, both in its solid and fluid elements, a connective tissue formation. Thus, I examined in succession under the microscope a common adenoma of the neck, which I recently extirpated; a fibro-cellular polypus of the ear; and a portion of the tumour we are now considering; and I found it quite impossible to distinguish one from the other, either from the stroma, or from the form or size of their cells. Whether this tumour has been developed originally from the lymphatic glands, could only be determined by a careful investigation of the early history of the case; and I think that the evidence is rather against this supposition than in favour of it. I found my opinion on the confluent character of the tumours, which do not appear to be composed of separate nodules; and on the absence of sympathetic engorgement of the mesenteric glands opposite the jejunum, in which situation these are most abundant, but where they only seem to be implicated accidentally at points where a secondary new formation has occurred. At all events the question is of little importance, as it does not affect the real nature of the tumour. A point of more consequence is that this tumour is *malignant,* which we shall see presently to be proved by its indiscriminate mode of growth, and spontaneous chronic ulceration. I think that only one other hypothesis is possible: might the formation not be tubercular? Now, tubercle begins with miliary knots, with *tubercles;* and though we could see this tissue in many places in its earliest stages, there were nowhere tubercles present. There was no friable cheesy infiltration, and the mesenteric glands were not affected separately, but merely involved here and there in a definite number of solid continuous tumours. Moreover, the elements of the growth were not tubercular; the shrivelled nuclei and fatty detritus of tubercle were not to be detected, even at points where the development was most advanced. Everywhere, on the contrary, were well formed, fertile cells; small in size, no doubt, but such as would be capable of vigorous and independent propagation.

The mode in which a malignant growth invades a tissue, can only be judged of by careful observation of the first stages of its development in that tissue. In the case before us, the comparative immunity enjoyed by the muscular layer of the bowel, while imbedded between two thick and rapidly increasing morbid masses, induced me to devote some attention to the encroachment of the disease upon this layer. That muscle is more slowly implicated than connective tissue in a cancer, is generally granted. It is also admitted that it sometimes undergoes fatty

degeneration and disappears; but whether the muscle cells ever directly contribute to the formation of cancer cells is a matter of dispute. I therefore made several microscopical preparations for the purpose of throwing, if possible, some light on this question. If the muscle cells undergo atrophy and are absorbed, they may be said to take no part in the process. If, on the other hand, they change their form, and remain as constituent elements of the new formation, their participation must clearly be allowed. I arrived at the same conclusion to which Bennett, Foerster, and other pathologists had previously come; that the nuclei of some of the cells enlarge, the form of the cells alters, and they thus become directly carcinomatous elements. The results of my observations were briefly—1st, That smooth muscular tissue may for a long time resist the encroachments of a cancer; 2nd, That some cells change their shape and become cancer cells; and 3rd, That the nuclei of others escape as such into the tissues, or are developed into cancer cells by a process of endogenous formation, and then make their escape; the muscular fibres being in both cases probably reabsorbed. Of these conclusions the first is indisputable, and exemplified in the preparations before us; the second is supported by the appearance of the singular cell represented in fig. 2, the origin of which could scarcely be accounted for on any other hypothesis; and the third seems justified by the presence of enlarged nuclei, and sometimes of evident cells, in the muscular fibres; by the presence of elements exactly similar in the adjoining tissues; and, lastly, by the absence of nuclei in some of the muscular fibres.

In conclusion, I wish to say a few words on the name which I have given to this disease. Two divisions of tumours are in common use—one into *innocent* and *malignant*, which is best adapted for the practical physician; the other into *homologous* and *heterologous*, which is best adapted for the pathologist, and which is, on the whole, the more scientific and precise. A *homologous tumour* is one, the cells of which are identical with, or only slightly differ from, those normally present in the tissue in which the tumour occurs; as in the familiar case of a fatty tumour developed in the areolar tissue. A *heterologous tumour* is one, the cells of which are quite different from those of the tissue producing them; as when epithelial cells are developed in an internal organ, and without connection with any epithelium. At the same time the division into innocent and malignant possesses obvious advantages; and fortunately both may be retained without causing much confusion. In fact, as a rule, a homologous tumour is innocent in its character, and a heterologous malignant. It is only necessary to bear in mind that there are some exceptions; because the *heterologous nature* of a tumour is *only*

one of the characteristics of malignancy. In a malignant tumour or *cancer*, using the term in its widest sense—1st, The cells do not generally resemble in form those of the tissue in which they occur; 2nd, They do not generally resemble one another—as pathologists say, they are *indifferent ;* 3rd, Whether these characters apply or not, they tend to propagate themselves indefinitely, and in great measure independently of the surrounding tissues, which they infiltrate without discrimination; and 4th, In a malignant growth there is a tendency to local fatty degeneration of the newly formed tissue, which on a free surface produces ulceration. Hence there are certain homologous tumours which are malignant or cancerous; and fibrous or fibro-cellular as well as glandular tumours, although not heterologous like a true carcinoma, may be divided into the innocent and the malignant. In our case the tumour is homologous in form, but malignant in its mode of development. It is even partially heterologous in form where it has attacked the muscular tissue; but still it is essentially homologous. It is an unlimited growth, according to the theory we have regarded as most probable, of cellular elements belonging to the areolar connective tissue, unaccompanied by a proportional increase of the intercellular substance; and accordingly we have named it a *malignant cellular fibroma,* or to avoid all pedantry, a *malignant fibro-cellular tumour.*

EXPLANATION OF PLATE.

Fig. 1.—Section of a portion of the tumour with an imbedded convolution of the bowel, three-fourths of the natural size. The infiltrated mucous tunic, the transverse and longitudinal muscular layers, and the new growth in the subserous tissue, are displayed in succession from within outwards. To the right is a mesenteric nodule partially divided.

Fig. 2.—Microscopical elements from a portion of the transverse muscular layer. They consist, 1st, Of isolated muscular fibres and cells, with enlarged nuclei; 2nd, Of the cellular elements of the new growth as met with throughout (below and to the left); 3rd, Of what appears to be a muscular cell transformed directly into a cancer cell (to the right.)